

#240

71-051A-00E

MARINER 9 ORBIT DATA TAPES

(D-12126--D-12133)  
8 tapes

MARINER 5

ORBIT DATA TAPES

71-051A-00E

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY THERE  
EIGHT 7-TRACK, 800 BPI TAPES WRITTEN IN BINARY. THERE ARE  
TWO RESTORED TAPES. THE ORIGINAL TAPES WERE CREATED ON AN  
UNIVAC 1108 COMPUTER. THE DR AND DS TAPES ARE 9-TRACK, 6250  
BPI. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D  
NUMBERS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR00861	DS00861	D12133	1	05/30/71 - 11/13/71
		D12130	2	11/14/71 - 01/03/72
		D12128	3	12/30/71 - 02/16/72
		D12129	4	02/14/72 - 04/19/72
		D12126	5	04/25/72 - 07/31/72
		D12127	6	07/30/72 - 09/06/72
DR00962	DS00862	D12132	1	08/30/72 - 10/06/72
		D12131	2	10/04/72 - 10/25/72

Request Agent

JCH

Request No.

RB4404

Acq. Agent

WSC

Mariner 9 Orbit Data Tapes

71-051A-00E

This data set contains eight Mariner 9 orbit data tapes (71-051A-00E). They were written on the Univac 1108 using Fortran V unformatted write statements, and are 800 BPI, binary, seven track, odd parity, single file tapes. Each tape is a series of records, which have been divided into groups, describing the tape itself, or containing actual satellite data. The tapes begin with a File Identification Group, followed by a User Label Group, an Orbit Data Summary Group, an Identifier Group, an Orbit Data Group (which contains the actual satellite orbit data), a Control Statement Group, and finally, a File Close Group (which ends with a physical end of file mark on tape). All records are written in logical records of 28 word size, with one exception. That exception is the Orbit Data Logical Records (part of the Orbit Data Group), which are blocked into 252 word records.

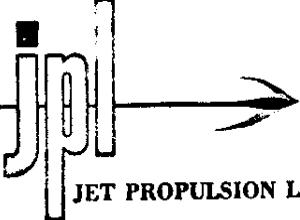
Five of the eight tapes do not end exactly as the format description indicates; that is, with a File Close group. These irregularities apparently arose upon generation of the tapes, and due to a lack of funds at JPL, the tapes cannot be regenerated. The tapes are therefore documented with whatever discrepancies that may exist, and have been verified by examination, and extensive correspondence with JPL, to be consistent with the descriptions which are given below. The eight tapes end as follows. D and C numbers, along with time spans are also given:

**\*\* SUPERCEDED BY RESTORED TAPES\*\***

<u>D#</u>	<u>C#</u>	<u>Time Span</u>	<u>JPL tape #</u>	<u>End Description</u>
D-12126	C-09631	04/25/72 - 07/31/72	G463	Complete
D-12127	C-09632	07/30/72 - 09/06/72	G883	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12128	C-09633	12/30/71 - Q2/16/72	J787	Complete
D-12129	C-09634	02/14/72 - 04/19/72	B498	Complete
D-12130	C-09635	11/14/71 - 01/03/72	A089	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12131	C-09636	10/04/72 - 10/25/72	H818	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12132	C-09637	08/30/72 - 10/06/72	H784	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12133	C-09638	05/30/71 - 11/13/71	A160	Ends with an Orbit Data Logical Record. All of the good interplanetary Data is present, although there is no Control Statement Group or File Close Group. Data ended due to an Attitude Control Maneuver.

\* Time Span of Data:

05/30/71 - 10/25/72



JET PROPULSION LABORATORY California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103

9 July 1973

Mr. Joe Johns  
Goddard Space Flight Center  
Greenbelt, Maryland 20770

Dear Mr. Johns:

With the advent of fiscal year 1974 all funding for Mariner '71 related tasks has vanished. Therefore, unless special arrangements can be made, we will be unable to correct the errors in the Mariner data tapes.

The errors on these tapes are as follows:

Tapes J787 and B498 are, to my knowledge, correct and follow the proper format as documented. → add G463, which is also complete.

Tape A160, containing all of the interplanetary phase data, terminates with an Orbit Data Logical Record. That is, there are no Control Statement Group or File Close Group records on this tape. The final data point is at 13 November, 23 hours, 56 minutes, 58 seconds, at which time an attitude control maneuver made the data unusable. The orbit insertion maneuver followed and the next good data can be found on the first orbit phase tape. Thus, even though tape A160 ends abruptly it does contain all of the good interplanetary data.  
→ is complete also

The other tapes (A089, G463, G883, H784, H818) do have some Control Statement Group records but end abruptly with a bad BCD Card Image record. There are no File Close Group records on these tapes. These tapes are all in error, of course, but again all of the data records are there.

I am sorry these errors exist. If you have any further questions, please call me or Phil Bramble.

Sincerely,

A handwritten signature in black ink, appearing to read "Randall K. Hylkema".

Randall K. Hylkema  
Orbit Determination Engineer

RKH:lm

Telephone 354-4321

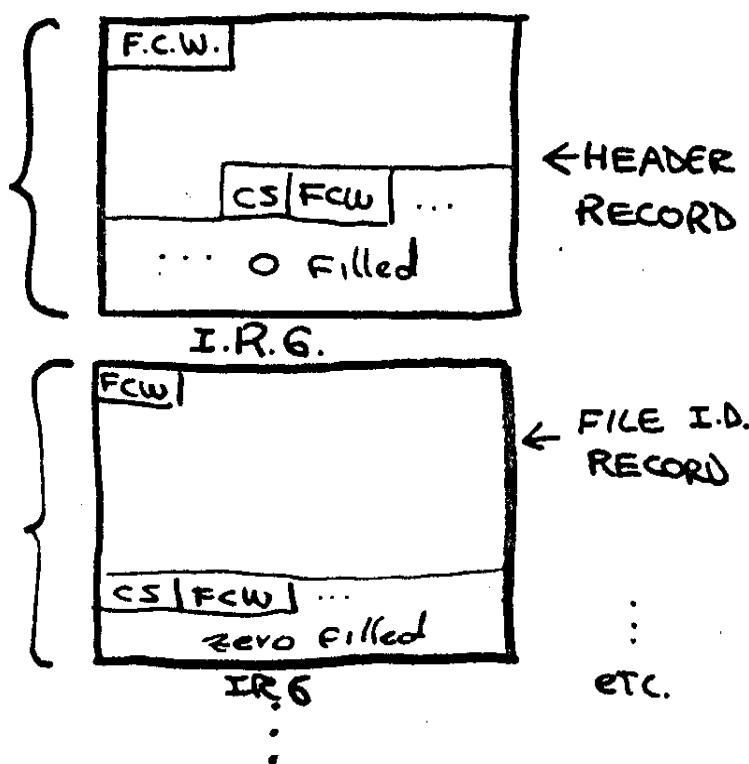
Twx 213-449-245

# MARINER 71 DAT → TAPE FORMAT

- WRITTEN ON THE UNIVAC 1108 USING FORTRAN-5 UNFORMATTED WRITE STATEMENTS.
- 7-TRACK, 800 BPI, ODD PARITY TAPES.

28  
WORD  
LOGICAL  
RECORD

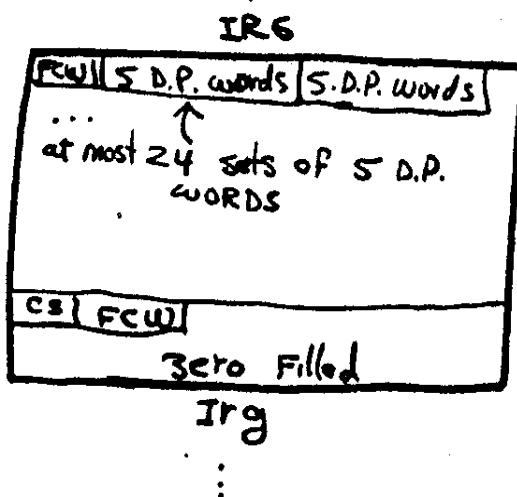
Ditto



All records are written in logical records of 28 word size, WITH ONE EXCEPTION.

(FCW = Fortran Control word.  
CS = Check Sum word  
IRG = Inter Record gap)

the exception is the Orbit Data Logical Record  
(p. 9-4 of enclosed document):



← Orbit data records are blocked into 252 WORD Records...as many as needed.

The final such record is followed by the Header Record of the Control Statement Group (see 9-5) which is back in the 28 word block size.

## SECTION IX

## OD FILE FORMAT

## GROUP RECORD WORD TYPE CONTENT

## A. FILE IDENTIFICATION GROUP

1. Header Record

1	I	11	Size (in SP words) of each logical record in A. 2.
2	I	4	Identifies content of A. 2 records as BCD.
3	I	1	Indicates group does not end with a trailer record.
4	I	101	File id. group indicator
5	I	0	Not used

2. One Record Which Identifies The File

1	I	10	The number of integral words in the record.
2-4	BCD	"SPACECRAFT ID=xx "	where xx is the spacecraft number input by the user in the OD-FILE statement.
5-9	BCD	"Y, M, D, H, M=xx, xx, xx, xx, xx 1108 "	where the x's represent the time the file was written.
10-11	BCD	" ODE=xxxxxx"	where x denotes the version of ODE that created the file.

## B. USER LABEL GROUP

1. Header Record

1	I	15	Size (in SP words) of each logical record in B. 2.
2	I	4	Identifies content of B. 2 records as BCD

3	I	0	Indicates group ends with a trailer
4	I	103	Label group indicator
5	I	0	Not used

## 2. Zero or More Records of BCD Descriptive Text

These would be input to the ODE by the user via the OD-FILE statement. The text would include any comments the user would have concerning the circumstances under which the file was created.

1	I	14	The number of integral words in the record.
2-15	BCD	84	BCD characters taken from the LABEL parameter of the OD-FILE statement.

## 3. Group Trailer

1	I	1	
2	BCD		Six BCD zeros

# C. ORBIT DATA SUMMARY GROUP

## 1. Header Record

1	I	9	Size (in SP words) of each logical record in C.2.
2	I	2	Identifies content of C.2 records as DPFP
3	I	0	Indicates group ends with a trailer
4	I	105	Orbit data summary group indicator
5	I	0	Not used

## 2. A Record For Each Data-Type That Exists For Each Station

1	I	4	Number of DPFP words in the record
2	DPFP	1.00000000c00eeffD+16	

where

c = tracking network indicator (See Orbit Data Group)

ee = receiving station number

ff = data-type indicator (See Orbit Data Group)

3	DPFP	Number of points	
4	DPFP	Time of earliest point	Seconds after January 1, 1950, 0:0:0.0
5	DPFP	Time of latest point	

3. Group Trailer

1	I	1
2	DPFP	0.0D+0

D. ORBIT DATA IDENTIFIER GROUP

1. Header Record

1	I	6	Size (in SP words) of each logical record in D. 2.
2	I	4	Identifies content of D. 2 records as BCD.
3	I	1	Indicates group does not end with a trailer record.
4	I	107	Orbit data identifier group indicator
5	I	0	Not used

2. One Record Which Identifies The Various Fields and Their Positions Within the Orbit Data Record.

1	I	5	Number of integral words in the record.
2-6	BCD	(TIMTAG, IDWORD, OBSVBL, FREQCY, PASSID).	

E. ORBIT DATA GROUP

1. Header Record

1	I	241	Size (in SP words) of largest logical record in E. 2.
2	I	2	Identifies content of E. 2 records as DPFP.
3	I	0	Indicates group ends with a trailer
4	I	109	Orbit data group indicator
5	I	0	Not used

2. A Series of Records (possibly void): (DATA RECORDS/as described below) \*\*\*

1      I      M	The number of double precision words of data in the record. M=120 except possibly for the last record in which M=R*5 where R is the number of logical records within the record.
2 to 2M+1 I	M/5 logical records

A logical record is as defined below

3. Group Trailer

1      I      1
2, 3      I      0, 0

The logical data records are ordered in increasing order of time/net/station/data type.

## \*\*\* Orbit Data Logical Record

<u>Words</u>	<u>Mode</u>	<u>Contents</u>
1, 2	DPFP	Time of observation; seconds after January 1, 1950 0:0:0.0
3, 4	DPFP	1. aaaaaaaaabcddeeffD+16 where aaaaaaaa = doppler compression time in hundredths of seconds for doppler data = ranging components for range data = 0 for angle data b = radio band indicator. 1 = S, 2 = X, 3 = L c = tracking network indicator. 1 = DSN, 2 = MSFN, 3 = ETR dd = transmitting station number ee = receiving station number ff = data-type indicator 11 = one-way doppler (F1) 12 = two-way doppler (F2) 13 = three-way doppler (F3) 14 = three-way coherent doppler (F3C) 31 = ETR range (ETR)

Words	Mode	Contents
		32 = MARK 1 range (MARK1) 33 = MARK 1A range (MARK1A) 34 = Tau range (TAU) 35 = Mu range (MU) 51 = azimuth (AZ) 52 = elevation (EL) 53 = hour angle (HA) 54 = declination (DEC) 55 = X30 (X30) 56 = Y30 (Y30) 57 = X85 (X85) 58 = Y85 (Y85)

5, 6	DPFP	One of the following i) doppler observable ii) range observable iii) angle observable
7, 8	DPFP	Reference frequency for doppler and range data, 0 for angle data, where reference frequency is defined as the frequency of the i) <u>Transponder</u> if doppler ground mode is one-way ii) <u>Transmitter</u> if doppler ground mode is two-way. Reference frequency is taken at light corrected time of data point.
9, 10	DPFP	1.aaaabD+16  where aaaa = Pass identification b = Split pass identification

## F. CONTROL STATEMENT GROUP

### 1. Header Record

1	I	15	Size (in SP words) of each logical record in F.2.
2	I	4	Identifies content of F.2 records as BCD.
3	I	0	Indicates group ends with a trailer
4	I	111	ODE control statement group indicator
5	I	0	Not used

2. BCD Card/Line Images of All the ODE Control Statements

1 I 14 The number of integral words in a record.

2-15 BCD 14 words of card/line image (84 BCD characters)

3. Group Trailer

1	I	1
2	BCD	Six BCD zeros

## G. FILE CLOSE GROUP

1. Header Record

1	I	1
2	I	5
3	I	0
4	I	0
5	I	0

2. End of File Mark

The entire OD file is written and read with non-formatted (binary) read and write FORTTRAN V statements. The data within each record are ordered and typed as specified above; the various file groups are also ordered A, B, C, D, E, F and G.

